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ABSTRACT

A television program employing a visual metaphor should be an effective instructional tool. Concrete imagery should make the metaphor more memorable and the topic more comprehensible. Splitting the metaphor between audio and video channels should make a strongly unified message, because the audience would have to compare the verbal and visual messages to understand the metaphor. Two versions of an informational television program were created for this study. The documentaries have identical off-camera narration about health care costs and reform in the audio. The traditional-visuals version uses images typical of education or news programs, but the visual-metaphor version uses images in a different way. The major physical metaphor underlying the abstract concepts of health insurance and the payment of health care costs is "a covering that protects against unpleasant or harmful sensations." The visual metaphor version of the program includes many different images of people needing or using physical coverings for protection. Subjects were 79 college freshmen who saw one of the two forms and responded to a Likert-type scale of opinions about the videos. No significant differences in attitude were found for the two groups of subjects. These viewers appeared to accept the visual metaphor as no different from other television production techniques, with no detrimental effects on attitude or comprehension. (Contains 47 references.) (SLD)

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Affective Response to Learning via "Visual Metaphor"

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Affective Response to Learning via 'Visual Metaphor'

LuEtt Hanson

In the home and in the classroom, people prefer to get their information from television (Chu & Schramm, 1975; Gallup Organization, 1987; Roper Organization, 1985, 1987). Unfortunately, liking television does not always lead to learning from it. People who watch broadcast news, for example, often misunderstand or forget the information they receive (Gunter, 1987).

Perhaps people learn poorly from television because they have difficulty processing its steady stream of words and pictures. Viewers' feelings of information overload may result from the mind's limited processing capacity, from poorly constructed television messages or from both.

What is the best way to assign information to television's two sensory channels? Answers to this question have come from two sources.

Production experts usually advocate making the sound and pictures "match," without carefully defining that term (Adams, 1992; Fang, 1985; Gayeski, 1991; Whittaker, 1989; Wurtzel & Acker, 1989; Yoakam & Cremer, 1985).

Researchers studying the effects of television messages have generally found that "related" or "redundant" messages improve recognition and recall of information (Davis & Robinson, 1986; Drew & Grimes, 1987; Evans, 1985; Hartman, 1961; Hobbs, 1986; Reese, 1984; Son & Davie, 1986). The terms "related" and "redundant" again refer to some degree of audio/video match, but they lack consistent definitions.

Neither group of writers adequately addresses the problem of abstract verbal information, for which there are no "matching" or "redundant" pictures. Research to date has ignored this condition; practitioners often advise the television producer to find a way to convert an abstract subject to one that is concrete (Craft, 1992; Fang, 1985; Yorke, 1987).

Television program creators, however, often need to communicate abstract subject matter. Television's perceived inability to do so effectively may be one reason it is not more popular as an instructional medium (Baggaley, 1973).

The problem of gaining information and understanding from a complex source

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such as the dual channels of television can be clearly examined through the lens of schema theory.

Schema Theory

A schema is a mental construct that organizes information (Markus & Zajonc, 1985), a sort of mental file folder. Schemata consist of clusters of concepts connected by networks of relationships among the concepts (Graber, 1988). For example, the schema "government" might contain the concepts of "representatives," "voters" and "laws" connected by the relationships of "elect," "debate" and "obey."

Schemata perform a variety of functions. They direct attention to relevant information, guide the processing and storage of information in memory and assist in retrieving information from memory. They enable people to make inferences when information is missing and to generalize when information is overwhelming. In short, they provide a framework for understanding and interpreting information (Graber, 1988; Markus & Zajonc, 1985; Rumelhart & Ortony, 1977).

According to Rumelhart and Ortony (1977), an individual has countless schemata. Which schema does a person use when confronted with new information?

The theory of construct accessibility says individuals will rely on whichever mental representation is most accessible in order to interpret information (Bruner, 1957). Constructs become accessible in a variety of ways, including recency and frequency of activation and activation of related constructs (Sanbonmatsu & Fazio, 1991). This means that when people encounter new information, they are likely to seize first upon a pattern of understanding that is familiar from recent or frequent use or that seems to be "close enough" to the new information to fit. For unfamiliar information, though, the most accessible construct may not be the most appropriate. According to Markus and Zajonc (1985), "accessible information may at times activate an inappropriate schema, setting an inference process in motion that may lead to wrong conclusions" (p. 179).

Producers of informational television programs may inadvertently cause this to happen, especially when dealing with abstract topics. Having learned to use visuals that are "associated with" or "related to" the topic, and often working under deadline pressure, they may resort to visuals that are easily obtained and familiar to the audience, but likely to activate inappropriate schemata. For example, a news producer creating a story about the financial failure of an airline might accompany the story with shots of airplanes taking off and landing, perhaps even "file tape" that the news organization has shown viewers before. While the familiar pictures are easily processed and are "related to" the abstract topic of airline bankruptcy, they may evoke in the viewers inappropriate schemata of regular air travel and continuously scheduled flights, conditions which may no longer exist.

A better method is needed for structuring television messages so as to link new abstract information to familiar knowledge in a way that encourages the formation of sound schemata. The metaphor is a good way to provide such a structure.

Metaphor

In traditional studies of rhetoric and linguistics, "a metaphor is a word or phrase applied to an object or concept that it does not literally denote in order to suggest comparison with another object or concept" (Ortony, 1980, p. 69). A metaphor consists of a "topic"--the concept under consideration, a "vehicle"--the concept with which it is being compared, and a "ground"--the elements the two concepts have in common (Ortony, 1975). In the metaphor "cats are philosophers," the term "cats" is the topic, "philosophers" is the vehicle and the qualities the two are presumed to share are the ground. Although all three parts are necessary for a metaphor to be complete, in casual reference it is common to say the vehicle "*is* the metaphor" for the topic.

Ortony (1980) identifies two conditions necessary for a metaphor to exist. First, the comparison must have at least one meaning that is literally nonsensical in the situation in which it is expressed. This causes tension in the receiver of the communication. Second, this "contextual anomaly" can be resolved, the tension relieved and understanding achieved by discovering the attributes the topic and vehicle have in common. Because of the active involvement required to understand it, a metaphor is a powerful tool for capturing attention, engaging the imagination and consolidating new insight.

Proponents of metaphor as a teaching device generally believe it accomplishes its task through the process of schema restructuring or accommodation (Johnson, 1980; Norman, 1978; West, Farmer, & Wolff, 1991). The vehicle presents an already-learned schema, "which, with relatively little modification, can be used to produce a new one" (Rumelhart & Ortony, 1977, p. 132). The vivid imagery that is often associated with a metaphor is also seen as a valuable aid to both memory and comprehension (Ortony, 1975) because it provides strong cues for memory storage and retrieval (Paivio, 1979; Sticht, 1979) and concrete concepts that are easier to learn (Davidson, 1976).

Visual Metaphor

Most discussions of metaphor as a pedagogic tool assume metaphors are verbal. Can metaphors be visual as well? There is evidence to suggest they can. Osgood (1980) found that subjects draw "meaningful parallelisms . . . between perceptions in one sensory modality (usually vision) and words in language" (p. 205). Connor and Kogan (1980) reviewed several studies supporting "the view that metaphor can operate through sensory or other media as well as through words" (p. 284). Their own work with subjects who were asked to group thematically related pictures led them to conclude that "comparable cognitive processes distinguish metaphoric operations in the pictorial and verbal media" (Connor & Kogan, 1980, p. 299).

If metaphors can be communicated both verbally and visually, then a television program could present a metaphor in the audio channel, in the video channel, or in both. Or, the metaphor could be split between the channels, with the topic in one and the vehicle in the other. When the content of a program is abstract, the topic must appear in the verbal channel because it deals with concepts that cannot be communicated precisely in pictures.

Putting the vehicle in the visual channel forces it to be concrete since one can only show images of particular things, not generalities (Reichmann & Coste, 1980; Smith, Balzano, & Walker, 1978).

In order to be an effective teaching device, a visual metaphor must meet the criteria for effective metaphors in general. A recent review of metaphors in teaching (Tripp, 1990) establishes the importance of using one metaphor or a set of related metaphors systematically throughout an instructional presentation.

Paivio (1979) insists a metaphor's vehicle must be concrete in order to make it a better memory cue. Petrie (1979) recommends that a vehicle be not only concrete, but vivid. One way to ensure vividness and memorability is to choose a vehicle with characteristics quite different from those of the topic (Ortony, 1979). However, Pollio and Smith (1980) warn against using overly obscure metaphors, since a learner may not be able to make the comparison necessary for understanding. Instead, the vehicle should show material with which the learners are likely to be familiar, so as to evoke an existing schema (Arter, 1977; Reynolds & Schwartz, 1983). A good visual vehicle must have both enough difference from the topic to invite mental involvement and enough similarity to the topic to ensure a sound transfer of information.

An apt vehicle for a visual metaphor, therefore, should be consistent, concrete, vivid without being obscure, yet readily identified with the abstract topic by a novice learner. A good strategy for identifying such a vehicle can be found in the work of Lakoff and Johnson (1980).

In *Metaphors We Live By*, Lakoff and Johnson (1980) hold that our conceptions of everyday reality are defined by metaphor. For example, we think of time as money that can be "spent" and arguments as wars that can be "won" or "lost." We speak of ideas as objects that can "be put into" words, of words as "containers" for those ideas, and so forth. In many cases, we make sense of abstract ideas by metaphorically assigning them concrete physical characteristics. The "ideas are objects" metaphor is an example of this. In most cases, a metaphorical understanding of reality is so ingrained in a culture that its members no longer recognize their standard ways of speaking about concepts as being metaphors until they are pointed out.

The pervasiveness of metaphor in everyday language can provide a rich source of visual metaphors for informational television productions. The producer should study the abstract topic, identify the physical metaphor by which it is commonly understood, and provide images that embody that concrete ground.

For example, abstract financial topics such as investments are often understood through the metaphor "money is water." Phrases like "liquid assets," "cash on tap," a "drain on savings," and a "pool of funds" show how people use the concrete vehicle, water, in a variety of ways. An informational program about investment might use images of water gathering in a pool, flowing, and draining away to accompany abstract verbal explanations of the topic.

In addition to being concrete, such visual metaphors should also fulfill the requirements of vividness and comprehensibility, since they are a visible

realization of a comparison that is common but not normally explicit. As indicated in the example above, they should also provide enough variety so that an informational program could use a related set of visual metaphoric images throughout without becoming obscure or boring.

A television program employing a visual metaphor should be an effective instructional tool. The concrete imagery should make the metaphor more memorable and the topic more comprehensible. Splitting the metaphor between the two channels should create a strongly unified message because the audience will have to compare the verbal and visual messages to understand the metaphor. In addition, the novelty and vividness of the visual metaphor should increase viewer interest in and appreciation for the viewing experience. While the visual metaphor should affect both cognitive and affective responses, this study focuses on the latter.

Methods

Two versions of an informational television program were created for this study. The documentary-style programs have identical off-camera narration in the audio channel and are eight and one-half minutes long. The narration explains some of the reasons U.S. health care costs are rising and describes three categories of proposals for funding health care, along with arguments for and against each type of proposal.

The traditional visuals version of the program uses images like those that might be found in typical education, news or documentary programs. The choice of images follows TV production guidelines that recommend showing associated subjects or visual padding when the actual topic cannot be shown (Millerson, 1985).

The visual metaphor version of the program uses images in a different way. Lakoff and Johnson (1980) argue that abstract concepts are "often--perhaps always--based on metaphors that have a physical and/or cultural basis" (p. 19). The major physical metaphor underlying the abstract concepts of health insurance and the payment of health care costs is "a covering that protects against unpleasant or harmful sensations." The visual metaphor version of the program includes many different images of people needing or using physical coverings to protect themselves in situations that are or could be physically unpleasant or harmful.

Subject attitudes were measured with a set of four statements to which the subjects responded on a five-point Likert scale on which "1" meant strongly disagree and "5" meant strongly agree. The four statements were:

1. I enjoyed watching the health care issues videotape.
2. I learned something from the health care issues videotape.
3. I could now explain health care funding options to someone else.
4. I would recommend the health care issues videotape to other students.

The subjects for this study were seventy-nine students in freshman orientation classes in the College of Fine and Professional Arts at Kent State University. The subjects viewed one of the two programs and responded to the attitude questions in late August through mid-September, 1993.

Results and Conclusion

Mean responses to the opinion statements stayed in the middle range with no evidence of extreme bimodal distribution. The lowest mean response was 2.33 and the highest was 3.61.

Calculation of t-tests between pairs of mean responses for males, females, and all subjects showed no significant differences in attitudes between viewers of the different versions of the program, either by gender group or for all subjects.

In a concurrent test, subjects' understanding of program content was measured with a twenty-question multiple choice comprehension test. Pilot test results showed no significant difference in comprehension between the traditional visuals and visual metaphor versions of the program, but the number of subjects was too small to detect any but extremely strong effects (Cohen, 1969). A full-scale version of this study has been conducted and the data are now being analyzed.

Viewers, at least those of college age, appear to accept the visual metaphor as no different from other television production techniques. It has no detrimental effects on attitude, and preliminary results indicate it has none on comprehension either. Therefore, the visual metaphor could take its place in the television production technique repertoire as one more way of visualizing information. Whether the additional creative challenge of creating a visual metaphor will be repaid with an increase in viewer understanding has yet to be determined.

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